

WHAT IS CLAIMED IS:

1. A method of fabricating a pressure intensifier for use in consolidation fabrication wherein at least two cured structures are bound together using an uncured preform, said method comprising:

5                   designing a virtual mold using an electronic designing program, said virtual mold having at least two portions joinable to form an injection cavity which defines said pressure intensifier;

                  fabricating a mold from a rapid prototyping fabrication process using a data file representative of said virtual mold;

10                  injecting a curable fluid material into said injection cavity formed when said joinable mold portions are mated together;

                  curing said injected fluid material; and

                  removing said cured pressure intensifier from said mold.

15                  2. The method of Claim 1, wherein said fabricating further includes using a stereolithography apparatus to fabricate said mold.

3. The method of Claim 1, wherein said fluid material is a room temperature vulcanizing silicone.

5 4. The method of Claim 1, wherein said joinable mold portions are further designed and fabricated having sealable mating edges.

10 5. The method of Claim 4 further including sealing said edges of said mated joinable mold portions for preventing said injected fluid material from escaping.

6. The method of Claim 1, wherein said electronic designing program includes a computer aided designing apparatus.

15 7. The method of Claim 1 further including joining at least two cured pressure intensifiers forming a composite pressure intensifier.

8. The method of Claim 1, wherein said pressure intensifier has a contour corresponding to said uncured preform.

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9. The method of Claim 1, wherein said pressure intensifier includes a mandrel.

10. A system for fabricating a pressure intensifier used in consolidation fabrication wherein at least two cured structures are bound together using an uncured preform configured to an angular shape of a bound area between said cured structures, said system comprising:

5 a computer having a processor and operably configured to create a computer aided design of a virtual mold having at least two portions joinable to form an injection cavity which defines a shape indicative of said pressure intensifier;

10 a rapid prototyping apparatus having a data input for receiving a data file from said computer representative of said virtual mold and operably configured to fabricate a corresponding three dimensional mold; and

means for injecting a curable fluid material in said injection cavity formed by mating said joinable mold portions.

11. The system of Claim 10, wherein said rapid prototyping apparatus includes  
15 a stereolithography apparatus.

12. The system of Claim 10, wherein said fluid material is a room temperature vulcanizing silicone.

13. The system of Claim 10, wherein said joinable mold portions are further designed and fabricated having sealable mating edges.

14. The system of Claim 13, wherein said sealable mating edges are temporarily sealed to prevent said injected fluid material from escaping said injection cavity.

15. The system of Claim 10, wherein said computer processor is operably configured to execute a CAD program.

16. The system of Claim 10, wherein a plurality of fabricated pressure intensifiers are fabricated and coupled by joint cement to fabricate a composite pressure intensifier.

17. A pressure intensifier fabricated by a method comprising:  
designing a virtual mold having at least two portions joinable to form an injection  
cavity which defines said pressure intensifier;

5 fabricating a three dimensional mold from a stereolithography process using  
a data file representative of said virtual mold;

injecting a fluid material into said injection cavity formed by joining said  
joinable mold portions; and

curing said injected fluid material.

10 18. The pressure intensifier of Claim 17, wherein said joinable mold portions are  
further designed and fabricated having sealable mating edges.

15 19. The pressure intensifier of Claim 18 further including temporarily sealing said  
sealable mating edges for preventing said injected liquid material from escaping prior to  
curing.

20. The pressure intensifier of Claim 17, wherein said fluid material is a room  
temperature vulcanizing silicone.